The Loxahatchee River Coalition's
Public Response to the recommended
Minimum Flow & Levels for the Loxahatchee River & Estuary

DRAFT – September 12, 2002

Introduction

The Loxahatchee River Coalition is comprised of various environmental and community-based organizations and individuals committed to preserving, and restoring, and protecting, the Loxahatchee River. While we appreciate the consideration that the South Florida Water Management District (District) staff and the District Governing Board have given to the comments of various sectors of the public, we have serious concerns as to the July, 2002 Draft of the Technical Document on Minimum Flow Levels (MFL) for the Loxahatchee River and offer the following comments in the spirit of constructive participation in the development of a restoration plan for the River.

Concerns Regarding Preservation of the River

I. Current data is incomplete

The District's Staff has indicated that the current data sets they are using are incomplete and therefore they should take into consideration a seasonally fluctuating minimum flow based on prior comprehensive research.

In a meeting with the Loxahatchee River Environmental Control District [LRED] on August 7th, SFWMD staff indicated that District data on salinity and flows for the Loxahatchee River is incomplete. LRED offered to share the bi-monthly data that they have collected for over ten years. SFWMD staff asserted that they need to install salinity, flow and temperature probes at various points in the river and that after one year they will have enough data to extrapolate a more complete model. Based on District staff comment we conclude that the SFWMD's current dataset is insufficient to construct an MFL regime that will adequately protect the River. While the District develops a more complete model, we suggest the District investigate use of the LRED's research, especially as interpreted in "Freshwater Flow Requirements and Management Goals for the Northwest Fork of the Loxahatchee River" (Dent & Ridler, 1997). This study recommends a minimum flow of 75 cfs for the height of the dry season (April-May) and suggests a seasonally fluctuating minimum flow up to 130 cfs throughout the wet season (July-November).

II Florida law requires the establishment not just of minimum flows, but also minimum levels.

Specifically, Florida Statutes §373.042 requires that water management districts develop minimum flows *and levels* for surface waters and aquifers[1]. The District's documentation and recommendations would only address part 1a of this statute by recommending a minimum flow

[1] *Florida Statutes*, Section 373.042(1a-b)

of 35cfs over Lainhart Dam[2]. It does not, however, recommend an explicit minimum level as required by part 1b.

III Minimum levels are required to prevent further harm and degradation to the River

Although the Lainhart and Masten dams could arguably enforce their own specific minimum levels upstream (the height of the dams), a minimum level needs to be set for that segment of the River that lies downstream of the Masten dam. If the District is determined to prevent further saltwater incursion, it cannot do so without setting a minimum level or otherwise ensuring that minimum flows over Lainhart are increased in proportion to unexpected changes in flows from groundwater and tributaries.

Since District staff has conceded that knowledge of the hydrodynamics and ecology of the Loxahatchee River and Estuary is incomplete,[3] it is therefore conceivable that supplying a minimum flow of 35cfs over Lainhart Dam may not be sufficient to keep the salinity at river mile 9.2 from exceeding 2ppt[4]. To safeguard against potential flaws in the District's minimum flow modeling, an explicit minimum level needs to be set for river mile 9.2 in conjunction with the 35cfs minimum flow over Lainhart Dam.

IV. Recommended minimum flow requires more controls

For the current recommendation of 35cfs over the Lainhart Dam to work effectively, more controls are needed.

Due to the lack of data for groundwater and stream flow from tributaries, the model calibration was based on the historic flow recorded at Lainhart Dam to estimate the total freshwater input to the river system. In the model, discharges from tributaries were calculated as a constant fraction of the discharge at Lainhart Dam (i.e. total surface freshwater input in the model was linked to Lainhart Dam flow via flow ratios [5]. Flow factors of 0.65 for Cypress Creek, 0.14 for Hobe Grove, 0.08 for Kitching Creek, 1.4 for Trappers and 1.16 for LOXTnpk were established. For example, if the flow at Lainhart Dam was in fact 100cfs, the model would recognize the flow for Cypress Creek at 65cfs, 14cfs for Hobe Grove, 8cfs for Kitching Creek, 140cfs for Trappers, and 116cfs for LOXTnpk.

Another assumption used in the model was a constant input from ground water of 40cfs. Cypress Creek, Hobe Grove, Kitching Creek and the NW fork at Trappers each received 10cfs of groundwater input for a total ground water input of 40cfs.

These model assumptions have important ramifications:

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[2] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15, 2002 draft, p. 149

[3] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15, 2002 draft, p. vi

[4] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15, 2002 draft, p. 148

[5] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15, 2002 draft, p. 79

1. The total inflow to the NW fork associated with a flow of 35cfs at Lainhart Dam is considerably larger and includes discharges from groundwater and tributaries. Under the 35cfs at Lainhart Dam Scenario, tributary flows would be modeled as follows: Cypress Creek 33cfs, Hobe Grove 15cfs, Kitching Creek 13cfs, Trappers 59cfs, & LOXTnpk 40cfs (flows include groundwater contributions of 10cfs).

2. The flows for the tributaries were assumed to be proportional to the flows from Lainhart Dam and hence may not accurately represent actual flows, especially with depressed water tables.

3. Groundwater levels that produce the assumed groundwater input may not be present when needed most.

The following controls would mitigate potential problems under the current proposal:

1. The establishment of a minimum level for groundwater so that the groundwater level that produces 40cfs in the model is adequately protected.

2. The establishment of minimum flows for the tributaries in order that their modeled flows corresponding to the Lainhart Dam minimum flow of 35cfs are protected.

3. When tributary surface water flows fall below their corresponding modeled flows for 35cfs at the Lainhart Dam, then the Lainhart Dam flows are to be increased by the difference.

4. When groundwater levels fall below the level needed to produce the modeled 40cfs contribution, then Lainhart Dam flows are to be increased to be commensurate with the groundwater loss.

V. Florida law requires MFLs for the entire River.

Florida Statutes §373.042 provides explicitly that the water management districts shall establish minimum flows "for all surface watercourses."[1] It was not the intent of the statute to require that the districts establish minimum flows only for federally recognized wilderness preserves. In fact, the law states that the districts shall establish minimum levels for groundwater, as well as, surface waters. Given the rate of development in the adjacent areas, we are concerned about the impact of further groundwater withdrawals not only on the river, but also on the surrounding protected areas (Jonathan Dickinson State Park, Riverbend Park, Cypress Creek Tract, and Pal Mar, etc.).

Although the Wild and Scenic portion of the NW Fork is an exceptional natural resource, the entire river is of significant ecologic, economic and aesthetic value to Palm Beach County and the State. The estuary is home to a thriving fishing and boating economy that contributes important revenue to the local economy. Riverfront property is among the most valuable in the area and homeowners have a vested interest in the health of the entire River. We do not agree with the District's reasons for setting only a minimum flow for a small segment of the NW Fork

based on the lack of "infrastructure and facilities."[6] The statute in question does not ask the District to "provide and manage"[6] flows. It requires the District to determine minimum flows and levels beyond which further withdrawals would be "significantly harmful to the water resources or ecology"[1] thus providing the districts with a limit at which to prevent further withdrawals.

VI. Sampling conducted to date is insufficient

In the June 10th draft of their FAQ about MFLs for the Loxahatchee River, the District staff cites that peer review observed that cypress trees were "not particularly good indicators of salinity stress."[7] In response staff selected a number of Valued Ecosystem Component [VEC] species. Although the District staff appears to have done a good job at assessing the health of the selected species, the selection of only large, woody plants[8] provides only a very narrow cross-section of the River's diverse population and is not a true indicator of overall river vegetation.

In our opinion the VECs of the river must necessarily include aquatic life such as herbaceous aquatic plants, fish, amphibians, and other species that are more sensitive to saltwater intrusion than just the few selected species.

VII. The report is overly reliant on aerial photography and contemporary data regarding the health of the River

In our opinion the District has relied too heavily on aerial photography in the assessment of the River's health and failed to obtain enough detailed hydrological & biological information (or "ground truth") necessary to properly support the broad assumptions based on the extant photographic record. Furthermore, the District has not satisfactorily addressed the possibility of harm that might have occurred between 1995 and 2002.

On page 123, the Draft states, "...19 additional acres [of freshwater vegetation] were lost from this community between 1985 and 1995." It does not indicate how many acres have been lost between 1995 and 2002. Throughout the Draft, the District presents 1995 (mainly photography) data as if it is up-to-date. If no aerial photography is available for 2000 or later then a thorough ground survey may be required in order to accurately determine the state of the River and watershed today.

In our opinion the District staff have not been provided with the resources required to accurately measure the River's current condition and how that condition has changed over time. While staff has surveyed the encroachment of mangroves into the cypress forest up until 1995 but we remain unconvinced that substantial damage has not occurred to the River since 1985. Furthermore, the justification for using the date of the River's Federal Wild and Scenic River (1985) as a

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[6] *Loxahatchee River Minimum Flows and levels: SFWMD staff responses to comments and frequently asked questions*, June 10, 2002 draft, Question no. 18

[7] *Loxahatchee River Minimum Flows and levels: SFWMD staff responses to comments and frequently asked questions*, June 10, 2002—draft, Question no. 13

[8] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15, 2002 draft, Table 31, p.116

benchmark (or base) for setting the MFLs, has not been substantiated. The state requirement for MFLs was created through the enactment of §373.042, *Florida Statutes* in 1972 and the designation of Jonathan Dickinson State Park occurred in late 1940's. If a date is needed for determining what stage of freshwater flow the MFLs should aspire to, then the District should use the designation of the State Park.

VIII. Seasonal variability is an important consideration.

A static minimum flow does not take into account seasonal variability, which is essential for the preservation of the River's natural systems.

The District touches on seasonal variability in pp. 11,12 and 97, and on the erratic nature of that variability from year to year (often as the result of hurricanes, storms, El Niño, etc.) in Figure 4 on p. 12. It does not, however, significantly address how native biota are dependent on such variability as did the SJRWMD in setting MFLs for the Wekiva River System.[9]

The SJRWMD, under the direction of Henry Dean in 1994, felt very strongly that setting one static minimum flow or level cannot sufficiently preserve either a lotic or lentic system as, over time, such a minimum often becomes the *de facto* average.[10] The SJRWMD felt that lotic systems were best protected by a regime of multiple MFLs. It is for this reason that the MFL regime worked out for the Wekiva River, by SJRWMD is so exemplary. We can find no justification for setting an MFL that affords less protection to the Loxahatchee River.

IX. As currently written the MFL Criteria would harm the Loxahatchee River

As currently written, the MFL Criteria would allow the minimum flow to be evaded substantially over-time and throughout the year, which would harm the River.

The wording of the minimum flow criteria needs to be corrected.[11] As it could be misinterpreted to suggest that, during dry periods, the minimum flow over Lainhart Dam could be allowed to fall below the minimum for 20 days at a time, repeatedly, so long that it is brought back up to 35cfs every 21st day. Under such an interpretation, the policy would allow the minimum to be met as few as 17 isolated days throughout a year (4.72% of the time). We doubt that, under the current modeling, this would be sufficient to prevent further harm.

We suggest that the criteria include a policy wherein low flows trigger water restrictions, as per Henry Dean's outstanding work on the Wekiva River MFL regime[12], or a limit on how many days the flow may fall below the minimum throughout a single year.

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[9] *Establishment of Minimum Flows and Levels for the Wekiva River System*, St. Johns River Water Management District, 1994, p. 16

[10] *Establishment of Minimum Flows and Levels for the Wekiva River System*, St. Johns River Water Management District, 1994, p. 15

[11] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15, 2002 draft, p.149

[12] Establishment of Minimum Flows and Levels for the Wekiva River System, St. Johns River Water Management District, 1994, p. 68

X. There is no evidence to support the 50% reduction of the Minimum Flow from 70cfs to 35cfs

There has not been shown significant credible scientific evidence in the July 2002 draft to support the reduction of the staff's recommended minimum flow over Lainhart Dam from 70cfs, in its May 2001 draft, to 35cfs. The modeling has not significantly changed between the two drafts to support such a drastic reduction.

In 2001, District staff recommended a minimum flow of 70cfs over Lainhart Dam in order to preserve the remaining freshwater habitat up to river mile 8.1 on the basis that as recently as 1970 a healthy bald cypress ecosystem resided in this area[13]. It was the staff's intention, at that time, to keep the saltwater wedge near river mile 8.1. This year, staff has decided to reduce that recommended minimum by half, nearly to a level of flow that staff previously believed would be disastrous to the freshwater cypress forest:

"A continuous discharge from Lainhart Dam within the 30 cfs range would allow saltwater to penetrate as far as 9.0 miles upstream which is within the remaining "healthy" cypress zone. Allowing saltwater to penetrate this far upstream would set up the opportunity for saltwater contamination of the floodplain groundwater system that could potentially result in the stress or mortality to the remaining bald cypress community. Such an event would be considered significant harm to the water resources or ecology of the area."[14]

30cfs is not much less than 35. Under the flow criteria proposed in the 2002 draft, wherein flows over Lainhart may be allowed to fall below 35cfs for up to 20 days at a time, it is reasonable to assume that the saltwater wedge will continue its encroachment upon the freshwater habitat. We have not found convincing hydrological support in the current document to justify such a marked change in recommended minimum flow.

The District acknowledges that a significant part of the National Wild & Scenic portion of the NW Fork was already seriously harmed by 1985 [15]. In our opinion, it was the responsibility of the District, as custodians of the River, to initiate restoration of the River at the time of its Wild & Scenic designation. All of the parties adopting the Loxahatchee Wild and Scenic River Management Plan are charge with preserving and enhancing the River to the fullest extent of its authority. To the extent that the District maintains the River in a damaged condition, neither preserved nor enhanced, it has failed to fulfill its agreement with the other agencies and the People of the State of Florida.

Our Recommendations

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[13] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, May 22nd, 2001, p. 100

[14] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, May 22nd, 2001, p. 101

[15] *Technical Documentation to Support Development of Minimum Flows and Levels for the Loxahatchee River and Estuary*, South Florida Water Management District Water Supply Division, July 15th, 2002, p. 131

The Loxahatchee River Coalition recommends that the District, in cooperation with the DEP and the public, develop a MFL regime that:

1. Sets explicit minimum flows and levels for the river and its major forks and tributaries;

2. Sets seasonal minimum flows and levels for wet and dry periods in order to preserve the natural seasonal variability of the river's hydrology, or in the alternative, sets explicit minimum low flows and levels, minimum average flows and levels and minimum high flows and levels;

3. Sets trigger points at which compulsory water restrictions come into effect;

4. Sets trigger points at which moratoria on further consumptive use permits are enacted; and

5. Dovetails with the restoration plan being developed by the District in cooperation with the Florida Department of Environmental Protection, the Florida Park Service, and the public. We hope this will also include a more aggressive land acquisition effort and the creation of more reservoir sites.

If the District is compelled, for whatever reason, to adopt a minimum flow for the Northwest Fork of the River, we encourage the District set a temporary minimum flow matching the District staff's recommendation in 2001, of not less than 70cfs over the Lainhart Dam. This recommendation is made with the expectation that the District address the additional scientific and policy issues outlined in the many public response documents, and move forward with a restoration MFL. Setting the temporary MFL at 70 cfs provides a more realistic assurance of both preventing further harm to the River and anticipating the eventual restoration of the wild and scenic segment.

The staff's recommended MFL criteria is inconsistent with the district's charge under the Wild & Scenic designation to "preserve & enhance" the River. Maintaining the Wild & Scenic river in a seriously harmed condition constitutes neither preservation nor enhancement. As far as the Wild & Scenic portion of the River is concerned, we ultimately expect to see an MFL criteria based on restoration of the entire Wild & Scenic corridor. Such an MFL criteria must necessarily protect flows from the River's tributaries, ensure seasonal variability and protect freshwater contributions from groundwater by setting a minimum level for surface waters both down and upstream of the Lainhart & Masten dams. An MFL that does not preserve and enhance the River to the Park Boundary, fails to meet the goals set in 1985 under the Wild & Scenic designation.

We look forward to working with the District to restore and protect the Loxahatchee River.

The Loxahatchee River Coalition